EXHIBIT D

"Visicorp's VisiOn"

Will this electronic desktop software become a standard for microcomputers?

Product preview reprinted from Popular Computing, issue 3/83, pp. 121-123.

Scheduled for release this summer, new software for the IBM Personal Computer displays several applications at a time, each in its own window. Visi On also lets you transfer information from one application to another with an electronic mouse.

A couple of years ago, Visicorp chairman Dan Fylstra had what you might call a vision for the next generation of computer software. He envisioned software that would appeal to what was truly becoming a mass market of computer users. With it, we'd no longer have to learn a flock of strange computer commands or adapt to the computer's way of working.

Rather, the new software would adapt itself to our work habits. It would let us use several applications at once, viewing them side by side on the screen and moving information freely from one to another. It would free us from the tedium of the keyboard by accepting input from easy-to-use pointing devices such as the new device known as the mouse or the light pen. By the summer of 1981, the hardware to make all this possible arrived with the IBM Personal Computer. And soon to follow was a spate of similarly endowed 16-bit machines. Clearly, the time is right for this new generation of software. And with Visicorp's recent introduction of Visi On, Fylstra's "vision" may be one step closer to reality.

Fylstra describes Visi On as a portable operating environment for 16-bit personal computers. It features a desktop management system that runs several applications programs simultaneously on your screen, transfers data directly between the applications, and lets you select options and manipulate text and data with a mouse, a handheld electronic cursor mover with program-control buttons (see Meet the Mouse, page 102).

Although a price for Visi On has not been set as of this writing, Visi On is scheduled for a summer release on the IBM Personal Computer. And, according to Visicorp, it will be available soon after that for personal computers from Digital Equipment Corporation, and, in time, for a bevy of other machines. Visi On is intended for various operating systems including MS-DOS and CP/M-86. It requires a 16-bit microprocessor such as the 8086, the 8088, or the 68000, as well as 256K bytes of main memory and, to run multiple applications, 620K bytes of disk space.

Visicorp hopes to have spreadsheet, word-processing, database management, and graphics programs available with the initial release of Visi On. Also, people who already use Visicorp products will reportedly receive a price break and a path to upgrade their programs for Visi On.

According to Fylstra, marketing plans for Visi On include both end-user retail sales and distribution through computer manufacturers who want to make the product standard on their machines. The company will also be making an effort to help third-party software developers gear their products specifically for use with Visi On. The mouse, says Fylstra, will be made available through Visicorp or another manufacturer, although Visi On can also be used with other pointing devices like the light pen or joystick.

The electronic desktop

Simply put, Visi On simulates on your screen the way your desktop appears while you work. Just as you can place several papers on your desk at a time, Visi On lets you simultaneously display several applications on your screen. Each application appears in a window. One window might show part of a spreadsheet, another might show some text written with a word-processing program, and another might show business graphics.

You can move the windows from place to place or overlap them just as you would papers. If you're working on one application but wish to switch to another, you can move the cursor to the desired window and click the mouse's select button to activate it. To close a window, open a new one, or adjust the size of one, you use the mouse to select the appropriate commands displayed along the bottom of the screen. Closed windows are listed in the upper right-hand corner of the screen.

Because Visi On integrates applications, you can transfer information from one to another. In other words, parts of documents can be electronically cut and pasted onto one another or into a final report. That way, you could design a pie chart based on spreadsheet data, then paste it into a report you're writing with a word processor. Moreover, according to William Coleman, group manager in charge of integrated systems, because Visi On employs a bit map to print text and graphics on the screen, you have the option of changing the size of your chart or any graphics at will.

Easy to learn

Visicorp claims that users can learn to work productively within 30 minutes and can apply standard command techniques to all Visi On applications. Users are able to operate the computer with the mouse and just nine commands. As a further aid, when you use the mouse to point

to a command, a prompt line appears to describe the command's function.

You use the buttons on the mouse to select Help to display Visi On help menus, Open to open a window onto a task you select, Close to close a window, Frame to change the size of a window, Full to enlarge a window to full-screen size, Option to display options available to you such as shading or cross-hatching for business graphics applications, Transfer to move data from one application to another, Stop to cancel a command, and Save to save data on the screen overnight or until you begin working again.

In addition each applications program has its own line of commands displayed across the bottom of its window. For instance, if you're working on a document, the word-processing commands – delete, move, find, and so forth – are displayed.

To help new users through procedures, both the main Visi On program and individual applications programs feature an extensive set of help instructions. For example, if you're working on a report and you need to restructure a part of the text but you forgot how to do it, you can frame the help instructions in a window next to your report and scroll through them to find what you need.

To further enhance ease of use, Visi On changes the shape of the cursor to give you feedback about what's going on in the program. The cursor takes one of three shapes: an arrow, an hourglass, or a four-pointed shape Visicorp calls a "rose." When you're making selections or pointing to options, the cursor is an arrow. When you ask the system to do something, like install a new program, the cursor changes into an hourglass while you wait for it to complete the task. While you scroll vertically or horizontally through information in a window, the cursor assumes the shape of a four-pointed "rose."

Split-level software

There are two layers to the Visi On system. "The top layer is Visi On," explains Coleman. "That's what you see on the screen. It's the windows and the functions, and so forth. But Visi On actually rides on top of a lower layer of system services that we call Visihost."

Why two layers of software? In order to run Visi On with various computers, a portion of the program must be recoded to meet the idiosyncrasies of each one. Rather than recode all of Visi On for each computer, Visicorp must recode only a relatively small kernel (about 25 percent) of the program. That low-level kernel is called Visihost and it is customized for each host computer.

Visihost handles all the memory, the graphics on the screen, the output to printers and devices, and all the input and output to disks. It provides many functions of an operating system. But, says Coleman, because it features virtual memory for complex programming and raster-graphics operations for displaying text and graphics, it's more sophisticated than the operating systems used on personal computers today.

The other 75 percent of Visi On is the same for all host machines. It is written in C, the programming language used in Visicorp's program development environment. Applications such as word processing and the like run one layer above Visi On.

By using this split-level approach for their new software, the makers of Visicalc fully intend Visi On to become a universal operating environment for 16-bit personal computers. Visicorp's goal is to provide users with an environment in which they can run a variety of applications on a variety of machines with just one set of operating commands.

Visi On versus Lisa

It's too soon to make a fair comparison between Visi On and Lisa, Apple's electronic desktop system. For one thing, Visi On is not nearly ready to be tested. And for another, it is attempting to do with software alone what Lisa does with software and dedicated hardware.

When Visi On is fully geared up, however, it will be important to see whether it can provide adequate processing speed with its multiple levels of software or whether users will spend much of their time watching Visi On's cursor in the hourglass mode. It will also be important to see whether the screen resolution offered by host computers will provide a practical work space or whether the desktop will look confusing and cluttered. Still another consideration is whether Visi On can duplicate any of Lisa's idiot-proof features that, say, prevent you from switching off the computer until your data has been saved.

Whatever the final verdict, it's clear that the next generation of software has arrived and that Visicorp's bold step is aimed at making personal computers more versatile and simpler to operate than ever before.

by Phil Lopiccola and Rachael Wrege

Phil Lopiccola is a senior technical editor of Popular Computing *and Rachael Wrege is the West Coast editor of* Popular Computing.